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CONTENTS

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ORIGINAL ARTICLES

Condom use and the risk of HIV infection: who is being protected?

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SUMMARY

Descriptive baseline data at enrolment into a cohort of male factory workers who were tested for HIV serology and monitored for sero-conversion over time, were analysed for condom use. At recruitment, the 1 146 men were asked about their sexual behaviour, history of sexually transmitted diseases (STDs), condom use and circumstances under which condoms were used.

HIV seroprevalence in the cohort was 18,2 pc. Self reported use of condoms was low, with only 5 pc of the men reporting using them all the time. Forty four pc reported that they had never used a condom, 11,5 pc tried a condom only once, and 30,5 pc used condoms less than half the time. HIV positive men were more likely (Odds Ratio [OR]= 2,2 95 pc CI: 1,3 — 3,3) to use condoms than those who tested negative. Men using a condom more than once were younger and had more education (p values < 0,0005).

Univariate analysis showed that men with self reported risk factors for HIV infection were more likely to use condoms. Significantly more condom users reported paying for sex, multiple sex partners or (for married men) a girlfriend (p < 0,005). Condom users also more often had a history of genital ulcers, urethral discharge or other STDs. Few married men (24 pc) reported using a condom with their wives. Condom use was more commonly reported with commercial sex workers (44 pc) or other extramarital partners (36 pc). Some risk factors for HIV infection were also present amongst men who reported that they did not use condoms.

Independent determinants of condom use identified by stepwise logistic regression analysis included young age, having a girlfriend (OR = 2,2; 95 pc CI: 1,47 — 3,3), number of sex partners in the last year (OR = 1,27; 95 pc CI: 1,06 — 1,51 per partner), and paying for sex in the preceding year (OR = 1,74; 95 pc CI: 1,06 — 2,83).

The results show that men use condoms with partners considered risky, such as prostitutes or girlfriends but use condoms less often with their wives. The results underscore the need for health education for behavioural change that promotes universal, consistent use of condoms or monogamous partnership.

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INTRODUCTION

Programmes for the prevention of heterosexual transmission of the human immunodeficiency virus (HIV)

appear not to have the desired impact in many countries. Morbidity and mortality from HIV have made AIDS one of the major public health challenges of our time. Stopping HIV infection is the first line of defence at the present time, in the absence of a vaccine or cure.

Current HIV/AIDS education messages encourage people to stick to one partner in a mutually faithful relationship or to use condoms. Usually fidelity is promoted as the preferred strategy, but if it is not possible then condoms should be used. In a setting where many married men have girlfriends or pay for sex, condom use is relegated to extra marital relationships. But the scenario of men infected by commercial sex workers or casual girlfriends and in turn infecting their wives is not addressed with this strategy.

Beyond the message to "Be careful that what you take home tonight is not HIV" women who are wives have been neglected as a risk group. The popular identification of commercial sex workers as a high risk group obscures the fact that women are at risk of infection because their husbands, who are often their only partners, have other unprotected sexual relationships. Further, women are dependent on male condoms for protection, which require male participation as well as consent.

Increase in condom distribution is now reported in some developing countries, including Zimbabwe, in response to the AIDS[1,2] epidemic. That increased condom demand reflects increased use is supported by a decline in outpatient sexually transmitted disease (STD) attendances in some areas of Zimbabwe.[3,4] Researchers have looked at condom use particularly in defined high risk groups such as commercial sex workers and truckers. However, with the current extent of the HIV epidemic, it is important to focus attention beyond the convential high risk groups. It is especially unclear how much of condom use is within marriage and how much outside marriage. In Harare STD attendances have declined to one half the 1989 levels during 1993. However, the extent of behavioural change for both personal and partner protection remains unclear.

The present study documented self reported condom use among male urban factory workers in the Zimbabwe AIDS Prevention Project (ZAPP) a collaborative study in the University of Zimbabwe Medical School. The main objectives of this project are to:-

1. Document risk behaviours and incidence of HIV infection in a group of seronegative men through longitudinal follow up.
2. Determine the biological and associated behavioural risk factors for HIV infection.
3. Identify current strains of HIV causing infection among the cohort through virologic isolates from seroconverting subjects.

Cross-sectional data on condom use at recruitment is reported in the present study.

MATERIALS AND METHODS

Harare factory workers were invited to participate in the Zimbabwe AIDS Prevention Project. At recruitment, a baseline questionnaire was administered which included information on socio-demographic status, STD history, sexual behavior and use of condoms. Following appropriate counselling and informed consent blood was collected for HIV antibody testing by ELISA, using both the Abbott and Behring second generation ELISA assays.

SPSS statistical software packages were used to analyse the data. The student's t-test was calculated for continuous data and the chi-square for categorical variables. Step-wise logistic regression was used to assess the independent predictors of condom use in a multivariate model.

RESULTS

Condom use and HIV serostatus was determined in 1 146 male factory workers. At baseline 208 (18,2 pc) of the men tested positive for HIV.

Self reported condom use was low, with only 5 pc of the men reporting using them all the time. Overall, 505 men (44,1 pc) reported that they had never used a condom, 132 (11,5 pc) had tried once, 350 (30,5 pc) used them occasionally and 104 (9,1 pc) reported using them often (more than 50 pc of the time).

The rate of reported condom use was stratified by HIV serostatus and is given in Table I. Although, overall, HIV positive men reported more condom use, only 3,4 pc of HIV positive men reporting consistent condom use at every sexual encounter.

Table I: Distribution of condom use by HIV serostatus.

Rate of condom use	HIV Status HIV +ve freq	pc	HIV -ve freq	pc
Never	62	29,8	443	47,2
Tried once	25	12,0	107	11,4
Occasional (,50 pc)	85	40,9	265	28,3
Often (.50 pc)	29	13,9	75	8,0
Always	7	3,4	48	5,1
Total	208	100,0	938	100,0

Table II: Distribution of condom use by age and serostatus.

HIV +ve

Age (Years)	Ever n	pc	Never n	pc	Total
< 19	3	2,1	1	1,6	4
20 — 29	89	61,0	37	59,7	126
30 — 39	43	29,4	18	29,0	61
40 +	11	7,5	6	9,7	17
Total	146	70,2	62	29,8	218

HIV -ve

Age (Years)	Ever n	pc	Never n	pc	Total
< 19	9	1,8	5	1,1	14
20 — 29	264	53,3	200	45,1	464
30 — 39	147	29,7	155	25,0	302
40 +	75	15,2	83	18,7	158
Total	495	52,8	443	47,2	938

p < 0,000005 for younger age.

When the men were asked about 'ever-use' of condoms, the subjects who tested positive for HIV were more likely to have used a condom (Odds Ratio [OR] = 2,2; 95 pc CI: 1,3 — 3,3) than those that tested negative. Condom 'ever-use' was reported by 70 pc of HIV positive men and 52,8 pc of those who tested negative.

Men who reported condom use more than once were younger or had more education (univariate p values < 0,00001). The modal age group in both HIV positive and HIV negative men was the 20 to 29 year old age group. Condom 'ever-use' in the HIV positive 20 to 29 year old age group was 61 pc as compared to 53,3 pc in the HIV negative group (p < 0,005). Table II shows the distribution of condom 'ever-use' by age and HIV serostatus.

Single men (63,6 pc) were more likely than married men (52,0 pc) to have ever used a condom (p < 0,005). Only 24 pc of married men reported ever using a condom with their wives. Amongst the men who reported never using condoms, 74,6 pc were married. The distribution of condom use by marital status is shown in Table III.

Table III: Distribution of condom use by marital status.

Marital Status	Ever Use freq	pc	Never freq	pc
Single (n=338)	215	33,5	123	24,4
Married (n=785)	408	63,6	377	74,6
Divorced/Widowed (n=23)	18	2,8	5	1,0
Total (n=1146)	641	100,0	505	100,0

Use of condoms was analysed further by sexual behaviour of all men and that of married men. Only 48 pc of men who paid for sex reported using a condom with a commercial sex worker. Sixty three pc of men who admitted having girlfriends reported ever using a condom with them.

Among married men with girlfriends 15,6 pc reported ever using condoms with their wives whereas 59 pc used condoms with their girlfriends (p < 00005). Among married men who reported that they paid for sex, 30 (19,7 pc) used condoms with their wives whereas 124 (80,4 pc) reported using condoms with either girlfriend (36,2 pc) or sex worker (44,2 pc).

Reported increased condom 'ever-use' was associated with increase in the number of sexual partners, as shown in Table IV.

Table IV: Reported number of sexual partners by condom use in the past year.

Number of Sex partners	Condom Use: Ever n	Ever pc	Never n	Never pc	Total
0	19	3,0	62	12,4	81
1	253	39,5	321	63,6	574
2	188	29,3	67	13,3	255
3+	181	28,2	55	10,8	236
Total	641	100,0	505	100,0	p <0,005

There was a significant trend (p=0,005) associating the likelihood of HIV seropositive status with increased percent of the reported number of times condoms were used. Further, a linear association was found between the number of condoms requested from the ZAPP researchers and HIV seropositive status (OR = 1,2 per pack, $p < 0,0005$). Univariate analysis indicated therefore that men with reported high risk factors for HIV infection were more likely to use condoms.

Significantly more condom users had a history of genital ulcers, urethral discharge, or any STDs, reported paying for sex, had multiple sex partners and an extramarital relationship (p values < 0,005).

Stepwise logistic regression analysis of all variables established four independent, significant determinants of condom use (controlling for education and HIV serostatus) as younger age (OR = 0,96; 95 pc CI: 0,93 — 0,98 per year), having a girlfriend (OR = 2,20; 95 pc CI: 1,47 — 3,3) number of sex partners in the last year (OR 1,27; 95 pc CI: 1,06 — 1,51 per partner) cash payment for sex in the last year (OR = 1,74; 95 pc CI: 1,06 — 2,83).

DISCUSSION

This study examined self reported condom use in a group of men working in factories. Seroprevalence was 18 pc, a figure in agreement with antenatal surveillance. Overall, very few men (5 pc) reported full compliance with condom use for all episodes of sexual intercourse. Forty pc reported that they never used a condom. The present study found an association between condom use and seropositive HIV status. This somewhat surprising finding may be explained by the fact that seropositive men correctly assess their risk, although they did not know their serostatus. As a result, they used condoms to protect themselves, although few practiced condom use consistently. Condom use for self protection could also explain why more men reported using condoms with girlfriends, mistresses and commercial sex workers but not with their wives. However, given that they were HIV seropositive at recruitment, their wives are often left unprotected. Similar findings were reported from Thailand[5] where there was no identified HIV risk in 69 pc of HIV positive women reporting for antenatal care except through their husbands. The reported low use of condoms by husbands with their wives could be a result of associating their use with unfaithfullness, or because wives have little power or self efficacy to negotiate condom use with their husbands. Thus, husbands who engage in high risk behaviour and fail to use condoms place themselves and their wives at risk. Further, while women who are in the sex industry remain vulnerable to HIV infection, they constitute a minority of women at risk for infection. There is need therefore for sexual behaviour change that also puts married women at reduced risk.

It is clear that people need to use condoms or remain monogamous at high enough rates to control the spread of HIV. There is thus, a compelling need for better understanding of sexual behaviour interventions. Such focused interventions should go beyond groups conventionally considered to be at risk for HIV. Groups that have previously been studied include sex workers, truck drivers or fishermen.[7-9] STD patients have also been the focus of behavioural risk research.[10,11] Thus, whereas the acquisition of HIV at the beginning of the AIDS epidemic might have been linked to only certain high risk groups, attention should no longer be limited to them. The present findings point to the need for targeting behaviour that puts an individual at risk, rather than high risk groups whose individual risk behaviour profiles may vary.

Earlier condom use studies in Zimbabwe looked at their use for contraception.[12] In the 1989 population based study by Mbizvo and Adamchak,[12] the self reported rate of current condom use was 6 pc. Rate of men reporting 'ever-use' was 45 pc. In a survey of contraceptive choices conducted among women in the 1988 Zimbabwe Demographic Health Survey, the reported condom use was 3 pc. However, following a male motivation campaign for increased awareness on con-

traceptive options, Piotrow *et al*[13] reported an increase to 57 pc of condom 'ever-use' and current use of 10 pc in a national sample survey in Zimbabwe.

A study in Zaire[14] documented a significant decline of HIV-1 incidence following a condom promotion intervention as well as STD screening and treatment amongst sex workers. Regular use of condoms with their clients went up from 11 pc to 68 pc over 36 months of intervention while HIV-1 incidence declined from 11,7 per 100 women years to 4,4 per 100 women years (p=0,003).

In Thailand use of condoms in commercial sex increased from 14 pc to 94 pc between 1989 and 1993[15] with a resultant decrease of five major STDs. Despite apparent increases reported in 'ever-use' of condoms due to the HIV epidemic, consistent condom use remains low.

The present data suggest that sexually active individuals use condoms at different rates depending on the type of partner with whom they are having a sexual relationship.

The present findings raise challenges on effective ways of promoting condoms both inside and outside marriage. Campaigns which stress condom use among high risk groups may have inadvertently reinforced the idea that condom use means promiscuity. Whereas condoms, in society could be viewed negatively as reducing sensation, health education strategies for condom promotion should articulate positive aspects such as prolonged pleasure and yet safe coitus likely to result in mutual satisfaction.

Condom use should not symbolise promiscuity, nor be associated only with extramarital relationships as this encourages distrust and stigmatisation. Public health campaigns should include emphasis on consistency of use as well as negotiation for condom use both within and outside marriage.

Health educators are challenged to develop creative ways of promoting condom use even within marriage where one partner's previous or current behaviour might be high risk. It is important to target both single and married men, who, generally, have overall control over using condoms.

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